

Full Stack Developer Technical Assessment

Task Overview

This task is inspired by a real-time, cloud-based web application developed using the MERN stack to monitor foot traffic on public infrastructure. The system ingests sensor data, visualizes analytics, tracks device status, and runs on Dockerized containers deployed to the cloud. You are required to build a simplified **Mini Footfall Monitoring System**, demonstrating your ability to work with real-time data, full-stack architecture, and modern deployment practices.

Task Requirements

◆ Backend (Node.js + Express.js)

- Implement RESTful APIs to:
 1. `POST /sensor-data`: Accept footfall data from a sensor
Payload: `sensor_id, timestamp, count`
 2. `GET /analytics`: Return aggregated footfall data per hour/day.
 3. `GET /devices`: List all devices with their status (active/inactive based on last update).
 - Store all data in **MongoDB**.
 - Create a simple simulator script (Node.js) that mimics 2 sensors sending data every 1 hour.
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◆ Frontend (React.js)

- Build a dashboard that includes:
 1. **Real-time footfall chart** (past 1 hour).
 2. **Summary** of today's total footfall per sensor.
 3. **Device status cards** (showing last seen, and marking inactive devices).
 4. **Map view** showing sensor locations (static map or Leaflet with mock GPS coordinates).
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◆ DevOps / Deployment

- Dockerize both frontend and backend.
 - Create a `docker-compose.yml` to orchestrate local deployment.
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Expected Deliverables

1. **GitHub repository** with:
 - Well-organized source code.
 - Working Docker setup with local instructions.
2. **Short write-up** (in `README.md` or PDF):
 - Key assumptions you made.
 - High-level design decisions.
 - How you'd scale this system for production (e.g., cloud architecture, database partitioning, etc.).